



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,694	09/30/2003	Fufang Zha	USFMCR.066C2C1C	5086
20995	7590	04/26/2004	EXAMINER	
KNOBBE MARTENS OLSON & BEAR LLP			SORKIN, DAVID L	
2040 MAIN STREET			ART UNIT	PAPER NUMBER
FOURTEENTH FLOOR				
IRVINE, CA 92614			1723	

DATE MAILED: 04/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

XH

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/674,694	ZHA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	David L. Sorkin	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 30 January 2004.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-26 is/are pending in the application.  
 4a) Of the above claim(s) 20-23 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-19 and 24-26 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) 1-26 are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-19 and 24-26, drawn to a methods of cleaning a filtration module, classified in class 210, subclass 636.
  - II. Claims 20-23, drawn to a filtration system, classified in class 210, subclass 321.89.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the process could be carried out with a materially different filtration system, for example where gas bubbles are provided through a tube, rather than through "a distributed array of aeration holes in the lower potting head".
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

Art Unit: 1723

5. During a telephone conversation with Rose Thiessen on 14 April 2004 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-19 and 24-26. Affirmation of this election must be made by applicant in replying to this Office action. Claims 20-23 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 1-19 and 24-26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. These claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention:

Regarding claims 1-19, nowhere in the originally filed specification is it disclosed that the "the feed liquid ... provided to the vessel at a rate sufficient to cause an overflow" comprises a fouling material.

Further regarding claims 10-12, while "draining down" is described in the originally filed disclosure, a method comprising "draining down" and "overflowing" is not described. Instead, draining down is presented as an alternative to overflowing.

Further regarding claim 12, "continuously" draining down is not described in the originally filed disclosure. Only periodically draining down is disclosed.

Regarding claims 24-26, while the originally filed specification describes removing accumulated solids in an overflow, "overflow of a concentrated feed" is not described.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 1, it is unclear what, if anything, is required by the phrase "wherein gas bubbles may be introduced into the membrane module".

#### ***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1, 3,4, 6-9 and 13-19 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 96/07470. Regarding claim 1, WO 96/07470 discloses a method for filtering a feed liquid comprising providing a vessel (11), providing a membrane module

(12,13,14), the membrane module comprising a plurality of hollow fiber membranes (12), the membranes comprising a plurality of pores and an outer surface, wherein the membranes are mounted in a header (including 13 or 14) in close proximity to one another so as to prevent excessive movement therebetween, wherein the membranes form an array, wherein gas bubbles may be introduced into the membrane module (see page 3, lines 20-22; page 10, lines 6-9), and wherein the membrane module is container within the vessel; providing a feed liquid to the vessel the feed liquid comprising a fouling material (see page 9, lines 9-16; page 16, lines 20-22), wherein the feed liquid is provided to the vessel at a rate sufficient to cause an overflow (see page 9, lines 9-16; Fig. 1); applying a transmembrane pressure to the membranes in the module, whereby filtrate passes through pores in the membranes, thereby producing a concentrated feed comprising the fouling material in the vessel (see page 2, lines 1-3; page 4, lines 13-14; page 9, lines 9-16; page 16, lines 6-7); and removing the fouling material from the vessel, wherein the fouling material is carried out of the vessel in the overflow therefrom (see page 9, 15-16; Figs. 1 and 2). Regarding claim 3, the membranes are mounted relative to one another so as to produce a rubbing effected between the membranes with vibrates (see page 9, lines 2-10). Regarding claim 4, the hollow fiber membranes are arranged in at least one bundle (see page 9, lines 2-4). Regarding claim 6, gas bubbles are provided by from within the module through gas distribution holes or opening (the holes of membranes 12 passing through 13) in the header. Regarding claim 7, gas bubbles are provided through at least one tube (12) situated within the module. Regarding claim 8, the tube has a plurality of holes (see

page 9, lines 2-5). Regarding claim 9, the tube comprises a comb of tubes (see Fig. 1).

Regarding claim 13, scouring the membranes is disclosed (see page 3, lines 20-22).

Regarding claim 14, the step of scouring comprises liquid backwashing (see page 11, lines 14-17). Regarding claim 15, the scouring comprises pressurized gas backwashing (see page 12, lines 6-9). Regarding claim 16, chemical cleaning is disclosed (see page 13, line 2). Regarding claim 17, chemical dosing is disclosed (see page 13, line 2)

Regarding claim 18, the scouring is continuous (see page 4, lines 1-2). Regarding claim 19, the scouring is intermittent (see page 4, lines 1-2).

13. Claims 1, 3, 4, 6-9, 13, 16-19 and 24-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Cote et al. (US 5,248,424). Regarding claim 1, Cote ('424) discloses a method for filtering a feed liquid comprising providing a vessel (81), providing a membrane module (see col. 22, line 28), the membrane module comprising a plurality of hollow fiber membranes (12), the membranes comprising a plurality of pores and an outer surface, wherein the membranes are mounted in a header (11) in close proximity to one another so as to prevent excessive movement therebetween, wherein the membranes form an array, wherein gas bubbles may be introduced into the membrane module (see col. 12, lines 3-6; col. 22, lines 24-29), and wherein the membrane module is contained within the vessel (see Fig. 6); providing a feed liquid to the vessel the feed liquid comprising a fouling material (see col. 2, lines 17-35; col. 22, lines 18-33), wherein the feed liquid is provided to the vessel at a rate sufficient to cause an overflow (see page 22, lines 20-24; Fig. 6); applying a transmembrane pressure to the membranes in the module, whereby filtrate passes through pores in the

membranes (see col. 3 lines 48 to col. 4 line 23), thereby producing a concentrated feed comprising the fouling material in the vessel (see col. 3 lines 39-44); and removing the fouling material from the vessel, wherein the fouling material is carried out of the vessel in the overflow therefrom (see col. 3, lines 39-44; col. 22, lines 18-35; Fig. 6). Regarding claim 3, the membranes are mounted relative to one another so as to produce a rubbing effected between the membranes with vibrates (see Fig. 3). Regarding claim 4, the hollow fiber membranes are arranged in at least one bundle (see Fig. 3). Regarding claim 7, gas bubbles are provided through at least one tube (67) situated within the module. Regarding claim 8, the tube has a plurality of holes (see page col. 21, line 13). Regarding claim 9, the tube comprises a comb of tubes (see Fig. 4). Regarding claim 13, scouring the membranes is disclosed (see col. 10, lines 15-27). Regarding claim 16, chemical cleaning is disclosed (see col. 7, lines 49-55). Regarding claim 17, chemical dosing is disclosed (see col. 7, lines 49-55). Regarding claim 18, the scouring is continuous (see col. 5, lines 42-43). Regarding claim 19, the scouring is intermittent (see col. 5, lines 42-43). Regarding claim 24, Cote ('424) discloses a method of removing accumulated solids from an outer surface of a plurality of hollow fiber membranes (12), the method comprising providing a plurality of porous hollow fiber membranes (12) extending longitudinally in an array to form a membrane module, wherein the membranes are arranged in close proximity to one another and mounted to prevent excessive movement therebetween, where the module is contained within a vessel (81); providing from within the array, by means other than gas passing through the pores of the membranes, uniformly distributed gas bubbles, the distribution being

such that the bubbles pass substantially uniformly between each membrane in the array to scour the surface of the membranes, vibrate the membranes, and remove accumulated solids from within the membrane module (see col. 10, lines 15-27; col. 21 lines 6-15; Fig. 4);and removing accumulated solids from the vessel, wherein the accumulated solids are carried out of the vessel in an overflow of a concentrated feed therefrom (see col. 3, lines 39-44; col. 22, lines 18-35; Fig. 6). Regarding claim 25, the membranes are mounted vertically to form the array and the bubbles pass generally parallel to a longitudinal extent of the fibers (see Figs. 3, 4 and 6). Regarding claim 26, the uniformly distributed gas bubbles are provided at a lower end of the array (see Figs. 3, 4 and 6).

***Claim Rejections - 35 USC § 103***

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 96/07470 in view of Ohkubo et al. (US 4,876,006). The method of WO 96/07470 was discussed above with regard to claim 4. The bundle of WO 96/07470 is not surrounded by a perforated cage. Ohkubo ('006) teaches surrounding a hollow fiber membrane bundle with a perforated cage (9) (see col. 3, lines 6-34). It is considered that it would have been obvious to one of ordinary skill in the art to have surrounded the bundle of

WO 96/07470 with a perforated cage as taught by Ohkuba ('006) to protect the hollow fiber membranes (see col. 3, lines 6-34).

16. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cote et al. (US 5,248,424) in view of Mahendran et al. (US 5,639,373). The method of Cote ('424) was discussed above with regard to claim 1. In Cote ('424) gas bubbles are provided through a separate header connected to a pressurized gas source, not through "the header" in which the membranes are mounted. Mahendran ('373) teaches providing the bubbles through a header (101) in which membranes are mounted (see Fig. 5; col. 19, lines 8-31). It is considered that it would have been obvious to one of ordinary skill in the art to have provided the bubbles of Cote ('424) through the header in which the membranes are mounted as taught by Mahendran ('373), because the Mahendran ('373) reference explicitly presents itself as an improvement upon the method of Cote ('424) (see col. 1, lines 8-13).

### ***Conclusion***

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David L. Sorkin whose telephone number is 571-272-1148. The examiner can normally be reached on 9:00 -5:30 Mon.-Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David Sorkin

David L. Sorkin  
Examiner  
Art Unit 1723